

Test Boosts 'Black Box' As Aid in A-Inspections

By Howard Simons
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Preliminary results from a United States underground nuclear explosion last month suggest that "black boxes" would be a greater help in policing a treaty banning all nuclear tests than was hitherto thought.

The test was conducted in a salt dome near Hattiesburg, Miss., on Oct. 22 as part of a national research effort to find better ways of detecting and identifying nuclear tests.

Yesterday, officials of the Defense Department's Advanced Research Projects Agency (ARPA) reported that geologically, the tired, old and smooth eastern United States is a better carrier of underground sound waves than is the hot, mountainous and youthful West.

Hints that this should be the case had come earlier from earthquake data; from a previous underground atomic explosion in New Mexico; and a series of chemical explosions set off in Lake Superior. But confirmation was lacking until the Project Salmon explosion, as the Hattiesburg test was dubbed.

Salmon was the first underground nuclear explosion conducted east of the Mississippi. It was a five-kiloton device (a kiloton is equal in explosive power to 1000 tons of TNT).

Essentially, what the preliminary results from Salmon show is that seismic waves are received clearer and stronger at a given distance, such as 1000 miles away, in smooth geology than in mountainous geology.

Scientists are not certain why this is so, but one theory is that higher earth temperatures in young mountainous regions tend to slow and dampen seismic waves, whereas the colder and older regions, such as found in the eastern United States, speed the waves along.

Geological formations similar to that of the eastern United States exist throughout the world, including the Semi-

palatinsk region of the Soviet Union where on Sunday the Russians conducted an underground nuclear test. Seismic signals from the Russian test were recorded by the elaborate U.S. test-detection network and reported by the Atomic Energy Commission.

Though ARPA officials were reluctant yesterday to discuss the political and diplomatic implications of the preliminary findings from the Hattiesburg test, other sources said that Administration officials were already studying these implications.

One possibility the new findings hold is to enhance the value of unmanned earthquake detection stations — the so-called "black boxes." Though the official U.S. position is that "black boxes" are no substitute for on-site inspections, "black boxes" are gaining a new appreciation as a promising supplement to such inspections.

The reason for the new look at "black boxes" is that when properly located, such as in areas comparable to the eastern United States, coupled with new earthquake detection equipment now being developed, the chances are that the number of suspicious events recorded by these stations can be reduced from what was thought possible only a year ago.

Carrying this possibility a step farther, some experts suggest that fewer suspicious events would require fewer inspections. And the need for fewer inspections might bring the U.S. and the U.S.S.R. closer to agreement on a treaty banning all nuclear tests.